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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,889	04/05/2004	Eiichi Kamiyama	119338	4027
25944	7590	04/12/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			ALI, HYDER	
			ART UNIT	PAPER NUMBER
			3747	

DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/816,889

Applicant(s)

KAMIYAMA, EIICHI

Examiner

HYDER ALI

Art Unit

3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/16/04 & 12/9/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The abstract of the disclosure is objected to because it exceeds 150 word maximum. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 1. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Drangel et al (US 6,550,441).**

As to Claim 1, Drangel et al discloses a compression ratio control method adopted in an internal combustion engine comprising the step of: providing a driving source that generates a rotational driving force to vary a compression ratio, a transmission module 32 that transmits the rotational driving force, and a compression ratio varying mechanism 10 that receives the rotational driving force transmitted by said transmission module 32; actuating said compression ratio varying mechanism 10 to drive at least one of a piston head 6 and a crank casing 2 against a combustion pressure, so as to change a positional relation between said piston head 6 and said crank casing 2 and vary a volume of a combustion chamber, in order to vary the compression ratio; producing a pressing force, which is to be applied to said piston head 6 and said crank casing 2, according to the change of the positional relation

Art Unit: 3747

between them, in the course of actuation of said compression ratio varying mechanism 10 to vary the compression ratio; and applying the pressing force to said piston head 6 and said crank casing 2 to reduce a transmission torque of the rotational driving force of said driving source by said transmission module, thereby assisting said compression ratio varying mechanism 10 to vary the compression ratio.

As to Claim 2, Drangel et al discloses an internal combustion engine that varies a compression ratio, said internal combustion engine comprising: a driving source that generates a rotational driving force to vary a compression ratio; a transmission module 32 that transmits the rotational driving force; a compression ratio varying mechanism 10 that receives the rotational driving force transmitted by said transmission module 32, drives at least one of a piston head 6 and a crank casing 2 with the received rotational driving force, so as to change a positional relation between said piston head 6 and said crank casing 2 and vary a volume of a combustion chamber, thereby varying the compression ratio; and a pressing module 38 that produces a pressing force, which is to be applied to said piston head 6 and said crank casing 2, in the course of actuation of said compression ratio varying mechanism 10 to vary the compression ratio, said pressing module 38 producing the pressing force according to the change of the positional relation between said piston head 6 and said crank casing 2 and applying the pressing force to said piston head 6 and said crank casing 2 to reduce a transmission torque of the rotational driving force of said driving source by said transmission module 32, thereby assisting said compression ratio varying mechanism 10 to vary the compression ratio.

As to Claim 3, Drangel et al discloses wherein said pressing module 38 applies the pressing force to the two mechanical members 6,2, such that the pressing force is combined with a first force, which is produced by a combustion pressure to be involved in the transmission of the rotational driving force to said compression ratio varying mechanism 10 by said transmission module 32, and with a second force, which is produced by actuation of said compression ratio varying mechanism 10 to be involved in the transmission of the rotational driving force, to reduce the transmission torque.

As to Claim 4, Drangel et al discloses said pressing module 38 comprises a spring mechanism that has a spring characteristic regulated to supplement the first force in an actuation state of said compression ratio varying mechanism 10 to decrease the compression ratio.

As to Claim 5, Drangel et al discloses said pressing module 38 comprises a spring mechanism that has a spring characteristic regulated to relieve the first force in an actuation state of said compression ratio varying mechanism 10 to increase the compression ratio.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyai (JP 7-26981) in view of Document (DE 24 04 231).**

Miyai discloses a crank case 4 and a cylinder block 13 are not integrally formed together but connected to each other by right and left two compression ratio changing cam shafts 23, 24. Both cam shafts 23, 24 are provided with small diameter parts 26 to be rotatably fitted to cam holders formed on the right and left lower ends of the cylinder block 13 and large diameter parts 28 to be rotatably fitted to the cam holders formed on the right and left upper ends of the crank case 4. Both cam shafts 23, 24 are so-called eccentric cams, and the center of the small diameter part 26 is horizontally and outwardly offset to the center of the large diameter part 28. Accordingly, when the cam shafts 23, 24 are rotated by the servo motor 35, the cylinder block 13 is moved up and down in relation to the crank case 4.

Miyai does not disclose pressing module comprises a spring mechanism. However, Document (DE 24 04 231) discloses variable compression ratio system for internal combustion engine; wherein cylinder block is raised or lowered in relation to crankcase by pressing module comprises a spring mechanism 5. It would have been obvious to a person having ordinary skill in the art to modify Miyai by employing variable compression ratio system for internal combustion engine; wherein cylinder block is raised or lowered in relation to crankcase by pressing module comprises a spring mechanism 5 as taught by Document (DE 24 04 231) in order to reduce the size of the servo motor.

Art Unit: 3747

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HYDER ALI whose telephone number is (571) 272-4836. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, HENRY YUEN can be reached on (571) 272-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hyder Ali

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